

09/556,607

PATENT

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REMARKS

Claims 1-57 remain rejected, now under 35 U.S.C. §102(b) as being anticipated by Haga et al., U.S. Patent No. 5,541,900 ("Haga"). This rejection is respectfully traversed and it is submitted that these claims recite patentable subject matter notwithstanding Haga.

Claims 1, 8, 11, 17, 19, 27-30, 36-38, 46-49 and 55-57 have been amended hereinabove to correct a minor typographical error in which the word "time" had been inadvertently omitted from a number of occurrences of the phrase "discrete pulse width modulated signal". Accordingly, all such phrases now correctly read as "discrete time pulse width modulated signal".

Using claim 1 as a representative example, the subject matter of the presently claimed invention is expressly recited as follows (with emphasis added):

An apparatus including a circuit for converting an analog signal to a pulse-width-modulated signal, comprising:

an integration stage configured to receive, combine and integrate an analog input signal and a set of one or more feedback signals and in accordance therewith provide a set of one or more integrated signals;

a modulation stage, coupled to said integration stage, configured to receive and modulate a final portion of said set of one or more integrated signals and in accordance therewith provide a discrete time pulse width modulated signal; and

a first feedback stage, coupled between said modulation stage and said integration stage, configured to receive said discrete time pulse width modulated signal and in accordance therewith provide a first portion of said set of one or more feedback signals.

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For purposes of simplifying the following discussion concerning various interrelationships (e.g., structural, functional, etc.) among “integrating circuit 10”, “amplitude modulation circuit 40” and “feedback circuit 30” of Haga, such elements of Haga are discussed as though analogous to the presently recited “integration stage”, “modulation stage” and “first feedback stage”, respectively. However, such discussion is merely to allow distinctions between the presently claimed subject matter and that disclosed by Haga to be more easily focused upon. No admissions are made or implied nor are any admissions to be inferred regarding any similarities, to the extent any exist, between such elements or their respective functions.

In contrast to the express recitations of the presently pending claims as emphasized above, in the Haga circuit of Figure 1 (and its related figures), “amplitude modulation circuit 40” is not coupled to “integrating circuit 10”, and “feedback circuit 30” is not coupled between “amplitude modulation circuit 40” and “integrating circuit 10”. Further, in the Haga circuit of Figure 18 (and its related figures), “feedback circuit 30” does not receive the modulated signal as provided by “integrating circuit 10”; therefore, it is not coupled between “amplitude modulation circuit 40” and “integrating circuit 10”.

Further still, “amplitude modulation circuit 40” is as just as its name states: an amplitude modulation circuit, not a pulse width modulation circuit. Moreover, while “amplitude modulation circuit 40” and “comparing circuit 20” together may produce a pulse width modulated signal, such signal is not a discrete time pulse width modulated signal. Hence, neither “amplitude modulation circuit 40” nor “comparing circuit 20” individually, nor “amplitude modulation circuit 40” and “comparing circuit 20” in combination, form the presently recited “modulation stage” which provides a discrete time pulse width modulated signal. To the contrary, any pulse width modulated signal produced by the circuitry of Haga is a continuous time pulse width modulated signal.

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As expressly noted at page 3, lines 5-14, of the present disclosure, one problem associated with a continuous time pulse width modulated signal is a higher degree of signal distortion. This problem is minimized, if not overcome, with the presently claimed invention in which a discrete time pulse width modulated signal is used, as noted at page 3, lines 18-23, and page 6, line 30, through page 7, line 5, of the present disclosure.

It is submitted that the foregoing remarks do not raise any new issues that require any further searching as such remarks are in complete conformance with those submitted in Amendments A and B. Accordingly, it is respectfully requested that this Amendment be entered and the presently pending claims be allowed and proceed to issuance. To expedite allowance and issuance of this application, the Examiner is respectfully requested to contact the undersigned by telephone to discuss any questions, comments or concerns.

Respectfully submitted,

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